

Plant Biological Evaluation Addendum (for Appendix E)

Forest Service
Easy Fire Recovery Project

August 6, 2004

In August 2004 several salvage harvest units were dropped from the Easy Fire Recovery Project FEIS for various reasons. The following units that were dropped from the analysis were referred to in the March 2004 Plant Biological Evaluation and Sensitive Plant Specialist Report.

Alternative 2

Proposed Salvage Regeneration treatment areas 16, 53, 59, and 61 were dropped under Alternative 2.

Alternative 3

Proposed Salvage Regeneration treatment areas 16, 59, and 61 were dropped under Alternative 3.

Alternatives 4 and 5

No treatment areas referred to in the March 2004 Plant Biological Evaluation and Sensitive Plant Specialist Report were dropped under Alternatives 4 and 5.

Direct, Indirect and Cumulative Effects

Because harvesting activities were never proposed within designated RHCAs there would be no direct or indirect effects to sensitive species habitat and therefore no effect to populations of these species as a result of these treatments. Dropping proposed harvest units would have no additional beneficial or detrimental effects on sensitive species habitat or populations. Therefore the effects sections of the March 2004 Plant Biological Evaluation and Sensitive Plant Specialist Report are still accurate. Only typographical changes need to be made to delete the units mentioned above under alternatives 2 and 3.

/s/Lori Bailey

August 6, 2004

Lori Bailey

Botanist

Easy Fire Recovery Project

APPENDIX E - PLANT BIOLOGICAL EVALUATION

Forest Service Easy Fire Recovery Project

Prepared by: /s/Lori Bailey
Lori Bailey
Botanist

Date: 3/31/2004

Reviewed by: /s/ Robert D. Curtis
Robert D. Curtis
Forest Range/Botany Staff

Date: 4/1/2004

Approved by: /s/ Brooks Smith
Brooks Smith
District Ranger

Date: 5/7/2004

Summary

Table 1--Threatened, endangered and sensitive (TES) plant species considered in the analysis of the Easy Fire Recovery project.

| Species (Status ²) | Scientific Name | Presence on the Malheur National Forest | Occurrence ³ | Effects ⁴ |
|----------------------------------|---|---|-------------------------|----------------------|
| Henderson's Ricegrass (S) | <i>Achnatherum hendersonii</i> ¹ | Suspected | HN | NI |
| Wallowa Ricegrass (S) | <i>Achnatherum wallowaensis</i> ¹ | Suspected | HN | NI |
| Transparent Milkvetch (S) | <i>Astragalus diaphanus</i> var. <i>diurnus</i> | Suspected | HN | NI |
| Deschutes Milkvetch (S) | <i>Astragalus tegetarioides</i> | Documented | HN | NI |
| Upswept Moonwort (S) | <i>Botrychium ascendens</i> | Suspected | HD | NI |
| Dainty Moonwort (S) | <i>Botrychium crenulatum</i> | Documented | HD | NI |
| Triangle Moonwort (S) | <i>Botrychium lanceolatum</i> | Documented | HD | NI |
| Mingan Moonwort (S) | <i>Botrychium minganense</i> | Documented | D | NI |
| Mountain moonwort (S) | <i>Botrychium montanum</i> | Documented | HD | NI |
| Northwestern Moonwort (S) | <i>Botrychium pinnatum</i> | Documented | HD | NI |
| Peck's Long-Bearded Mariposa (S) | <i>Calochortus longebarbatus</i> var. <i>peckii</i> | Documented | HN | NI |
| Dwarft Suncup (S) | <i>Camissonia pygmaea</i> | Suspected | HN | NI |
| Back's Sedge (S) | <i>Carex backii</i> | Documented | HD | NI |
| Inland Sedge (S) | <i>Carex interior</i> | Documented | D | NI |
| Parry's Sedge (S) | <i>Carex parryana</i> | Documented | HD | NI |
| Clustered Lady Slipper (S) | <i>Cypripedium fasciculatum</i> | Suspected | HN | NI |
| Northern Twayblade (S) | <i>Listera borealis</i> | Documented | HD | NI |
| Red-Fruited Lomatium (S) | <i>Lomatium erythrocarpum</i> | Suspected | HN | NI |
| Raven's Desert Parsley (S) | <i>Lomatium ravenii</i> | Documented | HN | NI |
| Colonial Luina (S) | <i>Luina serpentina</i> | Documented | HN | NI |
| Fleeting Monkeyflower (S) | <i>Mimulus evanescens</i> | Documented | HN | NI |
| Bridge's Cliff-Brake (S) | <i>Pellaea bridgesii</i> | Suspected | HN | NI |
| Least Phacelia (S) | <i>Phacelia minutissima</i> | Documented | HD | NI |
| Oregon Semaphore Grass (S) | <i>Pleuropogon oregonus</i> | Suspected | HN | NI |
| Arrow-Leaved Thelypody (S) | <i>Thelypodium eucosmum</i> | Documented | HN | NI |

¹*Achnatherum hendersonii* and *Achnatherum wallowensis* = *Oryzopsis hendersonii* (Vasey).

²Sensitive species from Regional Forester's List

³Occurrence

HD - Habitat Documented or suspected within the project area or near enough to be impacted by project activities

HN - Habitat Not within the project area or affected by its activities

D - Species Documented in general vicinity of project activities

S - Species Suspected in general vicinity of project activities

N - Species Not documented and not suspected in general vicinity of project activities

⁴Effect Determinations for Sensitive Species

NI - No Impact

MIH - May Impact Individuals or Habitat, but Will Not Likely Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species

WIFV - Will Impact Individuals or Habitat with a Consequence that the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species

BI - Beneficial Impact

Introduction

This Biological Evaluation (BE) analyzes the potential effects of the proposed action for Easy Fire Recovery Project, Malheur National Forest. This BE satisfies the requirements of Forest Service Manual 2672.4 that requires the Forest Service to review all planned, funded, executed or permitted programs and activities for possible effects on proposed, endangered, threatened or sensitive species.

The following sources of information have been reviewed to determine which TES species, or their habitats, occur in the project area:

- 1999 Region 6 Regional Forester's Sensitive Species List
- Forest or district sensitive species database(s) and the GIS mapping layer(s)
- Oregon Natural Heritage Program, Rare, Threatened and Endangered Plants and Animals of Oregon
- Project area maps and aerial photos.

Project Description

The Easy Fire Recovery Project Area refers to approximately 5,900 acres of the Easy Fire that burned in 2002 on the Prairie City Ranger District, Malheur National Forest. Proposed activities include:

- Harvesting fire-killed and fire-damaged trees by helicopter and ground based equipment.
- Developing appropriate stands outside the fire area as old growth and replacement old growth.
- Planting conifer species and using big game repellent (BGR) in upland and riparian locations.
- Removing hazard trees along system roads.
- Repairing road surfaces used to access this project area.

For more information on the location and proposed activities, refer to the Final Environmental Impact Statement for the Easy Fire Recovery Project, Chapters 1 and 2.

Prefield Review

The following sources of information were consulted during the prefield review to determine the presence/absence of TES species, or their habitats, within the Easy Fire Recovery Project:

- Regional Forester's Sensitive Species List
- Malheur National Forest Sensitive Species Plant List
- Sensitive Plants of the Malheur, Ochoco, Umatilla, and Wallowa-Whitman National Forests (1991)
- Forest or district sensitive species database(s) and the GIS mapping layer(s)
- Oregon Natural Heritage Program, Rare, Threatened and Endangered Plants and Animals of Oregon (2001)
- Project area maps (topographic maps and aerial photographs)
- Pertinent Literature (On file or borrowed from other sources)

The Prefield Review was performed to identify all sensitive species that could be encountered within the proposed Easy Fire Recovery Project area. Existing accounts of TES plant populations within the project area were found. One population of *Carex interior* is documented within the Easy Fire Recover Project area. Two other populations of *C. interior* are documented just outside the Easy Fire Recover Project area.

Potential habitat exists in riparian areas of Clear Creek and Mossy Gulch for 11 species listed as Sensitive by Region 6: *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. minganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima*.

Field Survey

Sensitive plant surveys were conducted in portions of the project area in 1979, 1980, 1982, 1984, 1988, 1989, 1990, 1996, 1997 and 2000. These past surveys reviewed areas by floristic walk-through survey (Nelson 1985) during specific times of the year for peak plant identification periods. Surveys completed before the 1999 Region 6 Sensitive Plant List was released are now incomplete because species on the list have changed.

Initial field reconnaissance for the Easy Fire Recovery Project area was first conducted in November 2002, a time inappropriate for locating the sensitive species that could be present. Therefore searches were focused on finding suitable habitat as opposed to finding actual plants. Potential habitat exists in the riparian areas of Clear Creek and Mossy Gulch for 11 species listed above.

Field surveys in 2003 were focused on areas identified in 2002 as potential habitat. All areas that were determined to be good habitat and have activities proposed within them were surveyed again in 2003. Due to low potential for effects, areas within RHCA's that were determined to have limited potential habitat and have no activities proposed within them, were not surveyed. Field surveys in 2003 documented one new population of *Botrychium minganense* located in Mossy Gulch.

Species Considered In Analysis

To identify habitats that may harbor sensitive plants, the physical and biological features in the project area are correlated with those in which sensitive plants are known or suspected to occur (Nelson 1985). Habitats suspected of harboring sensitive plant populations are identified based on aspect, elevation, and ecoclass (plant association). Brooks et al. (1991) describes specific habitat features for Malheur National Forest sensitive species. Forest botanists have compiled habitat data from field surveys for the remainder of species with potential occurrence, listed since the above book was written. The following potential habitats were documented within the project area.

Botrychium Species

Botrychiums, also known as moonworts or as grapeferns, are small primitive plants closely related to ferns. They reproduce by spores, and are known to be mycorrhizal, though many details of their life history and growth requirements are still unknown. Although green and apparently

photosynthetic, the species considered here are all capable of surviving for years with only sporadic above-ground growth, apparently drawing reserves from the host plants with which they have mycorrhizal connections. As a result, populations of these moonworts appear to fluctuate from year to year, depending on how many plants produce visible leaves and/or fruiting bodies. The factors determining yearly growth are not yet understood.

Botrychium ascendens, *B. crenulatum*, *B. lanceolatum*, *B. minganense*, *B. montanum*, and *B. pinnatum* are strongly associated with one another due to their common habitat requirements: seepy, perennially moist areas along streams and within shaded meadows. These 6 *Botrychium* species are found sporadically throughout the mountains of the Pacific Northwest and the Rockies, and *B. minganense* is known across Canada to the eastern part of the continent. In the Blue Mountains they have primarily been found between 5000 and 7500 feet in elevation.

Preferred habitat of these species is perennially moist ground at the edges of small streams, wet meadows, springs, and seepy openings in forest. The plants often favor shade from an overstory of conifers and/or riparian shrubs such as alder and red-osier dogwood, but also occur in openings or meadows with only grasses and forbs providing shade. Wet meadow edges with encroaching lodgepole pine are prime grapefern sites, as are the mossy openings around springs in mixed conifer forest that includes subalpine fir and Engelmann spruce. Since most of the plants are quite small and are difficult to find, they may be easily overlooked except in intensive surveys. Their habitat, on the other hand, is readily identified and protected or avoided during management activities.

Reproduction of these fern allies is accomplished by the dispersal of spores by wind and water, and pollinators are not required.

Botrychium minganense has been documented in Mossy Gulch. Potential habitat for all six *Botrychium* species is located in the riparian areas of Clear Creek and Mossy Gulch. Clear Creek RHCA burned with a severity rating of partial during the 2002 Easy Creek Fire. Partial severity contains a mixture of burn severities (unburned, light, moderate and severe burn) with no one severity dominating. Mossy Gulch burned mainly with a severe rating with small portions of the riparian area at light and moderate severity and some unburned areas. The area where *B. minganense* was documented was unburned.

Carex backii (C. cordillerana)

Carex backii is a tufted sedge that grows in lowlands to mid-montane elevation. Its range extends across southern Canada to British Columbia and south to Utah and Colorado. In Oregon it grows in dry forests and riparian woods at mid elevations, occurring in the Wallowa, Blue, and Steens Mountains and adjacent ranges. It is superficially grass-like in appearance and the inflorescence tends to be hidden in the foliage. Therefore, it is likely that this species is often overlooked when searching for sensitive sedges, and may be much more common in our area than believed.

C. backii is found in a variety of habitats from north to southeastern Oregon. In the Wallowa uplands, it is most common on steep southerly aspects in open ponderosa pine savannahs near thickets of *Symphoricarpos albus*. In the northern Blues, it has commonly been found closely associated with streambanks and gravel bars. In the southern Blues, it is also found in ponderosa pine forests on rocky ridgetops, or growing in the proximity of basaltic rock outcrops with Great Basin wildrye, chokecherry, and snowberry. In the Steens, it is found in quaking aspen/grass

associations adjacent to the major streams on steep slopes. These sites all show evidence of disturbance from substrate movement on steep slopes or in streambeds, or are closely associated with rock outcrops. They also are always in dappled to deep shade and have a shrub component. These sites are between 4900-6400' in elevation. Associated species include: *Juniperus occidentalis*, *Alnus incana*, *Cornus stolonifera*, *Ribes aureum*, *R. hudsonianum*, *Carex praticola*, *C. geyeri*, and *Poa pratensis*.

C. backii does not have creeping rhizomes, therefore, only reproduces by seed production.

Carex interior

Carex interior is a densely tufted sedge that grows in lowland to mid-montane elevations. It is a widespread N. American species found throughout the range of the Pacific Northwest, as defined by Hitchcock and Cronquist (1969); however, it is apparently uncommon in Oregon.

C. interior inhabits very wet riparian areas, such as swamps and wet meadows associated with seeps, springs, or streams. On the Malheur National Forest associated species include *Carex aurea*, *C. echinata*, *C. luzulina*, *C. stipata*, *Fragaria virginiana*, *Glyceria elata*, *Deschampsia cespitosa*, *Juncus balticus*, and *Mimulus guttatus*.

C. interior is not rhizomatous, therefore, most likely reproduces by seed only.

Carex parryana

Carex parryana is a loosely tufted sedge that grows from lowlands to moderate elevation. Its range is chiefly east of the continental divide, but it extends onto the Pacific slope in central and east Idaho and northern Utah; it is also known from northeast Oregon and central Nevada.

C. parryana grows in the driest communities of moist meadows, swales, and moist, low ground around streams and lakes, and on prairies and high plains as well. Associated plants found on a wetland classification plot on the Emigrant Creek RD were *Poa pratensis*, *Agrostis stolonifera*, *Juncus balticus*, and *Carex praegracilis*.

C. parryana can reproduce via creeping rhizomes, and by seed production.

Potential habitat for *Carex species* is located in the riparian areas of Clear Creek and Mossy Gulch. Clear Creek RHCA was burned with a severity rating of partial during the 2002 Easy Creek Fire. Partial severity contains a mixture of burn severities (unburned, light, moderate and severe burn) with no one severity dominating. *Carex interior* is documented in three sites in the riparian areas of Clear Creek and all known sites were unaffected by the 2002 Easy Creek Fire. Mossy Gulch burned mainly with a severe rating with small portions of the riparian area at light and moderate severity and some unburned areas.

Phacelia minutissima

Phacelia minutissima is a regional endemic of the Pacific Northwest, found in Oregon, Washington, Idaho, and Nevada. It grows at moderate elevations (5000 to 7000 feet) in the mountains in micro-habitats that are at least vernal moist. It is known from the Wallowas, and from 3 sites on the Blue Mountain Ranger District.

P. minutissima grows along streambanks in sagebrush communities, in aspen stands, and, in the Blue Mountains in particular, often in association with *Veratrum californicum* in vernal moist meadows. It also occurs on scablands that are vernal moist.

Populations of *P. minutissima* are most abundant and easily located in wet years, though its diminutive size, along with its annual life cycle, makes this plant difficult to locate. For this reason it is possible that it is more widespread than current records indicate.

P. minutissima has not been documented but potential habitat is located in the riparian areas of Clear Creek and Mossy Gulch. Clear Creek RHCA was burned with a severity rating of partial during the 2002 Easy Creek Fire. Partial severity contains a mixture of burn severities (unburned, light, moderate and severe burn) with no one severity dominating. Mossy Gulch burned mainly with a severe rating with small portions of the riparian area at light and moderate severity and some unburned areas.

Listera borealis

Listera borealis, northern twayblade, is a perennial orchid of moist forests. Its distribution ranges from Alaska and northern Canada, south into the Rocky Mountains to northern Wyoming and Utah. It is known in the Blue Mountains of eastern Oregon from the Wallowa and Greenhorn ranges. It is common in the north, but becomes quite scarce, with widely separated occurrences, near the southern extreme of its range. Known populations in the U.S. range in elevation from 3000 to 6500 feet.

L. borealis is typically found in moist coniferous forest, either along streams, or in dryish humus. It occurs from mid elevations to subalpine and alpine slopes. It inhabits cold air drainages, usually at streamside at lower elevations, but is not restricted to streamside at higher elevations. It most often grows with spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), and Douglas fir (*Pseudotsuga menziesii*) in the inland northwest. Most occurrences are associated with old growth forest with a tree canopy cover of greater than 60%. Low slope (less than 10 %), continuous moss cover, and organically rich substrate with a thick duff layer are other common features of *L. borealis* habitat (Cronquist et al, 1977; Hitchcock et al, 1969; Salstrom & Gamon, 1993).

L. borealis typically flowers in June and requires insect pollination, though pollinator species are not known. Like other orchids, *L. borealis* requires a fungal symbiont for seed germination and growth. The plant may then remain as an underground “mycorrhizome” for several years before it produces a photosynthetic stem. It may take another dozen years before the plant produces a flowering stem, judging from studies of similar species (Salstrom & Gamon, 1993).

L. borealis has not been documented in but potential habitat is located in the riparian areas of Clear Creek and Mossy Gulch. Clear Creek RHCA was burned with a severity rating of partial during the 2002 Easy Creek Fire. Partial severity contains a mixture of burn severities (unburned, light, moderate and severe burn) with no one severity dominating. Mossy Gulch burned mainly with a severe rating with small portions of the riparian area at light and moderate severity and some unburned areas.

Project Design Criteria

A 50-foot ATP (area to protect) would be established around the outer extent of all documented/mapped sensitive plant sites. Vehicles, equipment, and operations that would displace soils or damage plants, would not be permitted in the ATP. All trees would be directionally felled away from an ATP. Activity created slash would not be piled in ATPs. Seeding of decommissioned road segments within documented ATP sites would not occur. To ensure that sensitive plant populations are not inadvertently impacted from road reconstruction, prior to implementation a botanist would review the reconstruction plan.

Environmental Effects

Direct and Indirect Effects from No Action

The No Action Alternative would have no direct or indirect effects to sensitive plant populations because no ground disturbing activities are proposed.

Direct and Indirect Effects Common to Alternatives 2, 3, 4 and 5

Proposed hazard tree removal would have no direct or indirect effects to sensitive plant populations because no ground disturbing activities are proposed within potential sensitive plant habitats or known sensitive plant sites.

Conifer planting with BGR treatment in areas within regeneration units and areas outside units that burned with moderate or high severity would have potential to effect sensitive plant species, if sensitive plant species were present where scalping occurs. However the probability is low because planting of conifers would only occur in areas where conifers were removed by the 2002 Easy fire. The Sensitive plant surveys conducted in 2003 identified one new population. This population was in an area unaffected by the fire. If unidentified populations exist, they would most likely occur in areas unaffected by the fire. These areas would therefore be unaffected by conifer planting and BGR because planting is not necessary in these areas. BGR application would have no direct or indirect effects to sensitive plant populations because it would not be applied on sensitive plants.

Proposed road closures and road maintenance would have no direct or indirect effects to sensitive plant populations because no ground disturbing activities are proposed within potential sensitive plant habitats or known sensitive plant sites.

Proposed replacement ROGs and DOGs with new areas outside the fire would have no direct or indirect effects to sensitive plant populations or known sensitive plant sites because no ground disturbing activities are proposed.

Direct and Indirect Effects Common to Alternatives 2, 3 and 4

Proposed helicopter landings, and temporary roads, would have no direct or indirect effects to sensitive plant populations because no ground disturbing activities are proposed within potential sensitive plant habitats or known sensitive plant sites.

Direct and Indirect Effects from Alternative 2

Proposed Salvage Regeneration treatment areas 3, 4, 12, 13, 16, 49, 50, 51, 52, 53, 59, 61, 63 and 65 are adjacent to potential habitat for *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. manganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima*. Because harvesting activities are not proposed within designated RHCAs and with the implementation of project design criteria listed above, there would be no direct or indirect effects to these species habitat and therefore no effect to populations of these species as a result of these treatments.

Proposed Salvage Regeneration treatment area 53 is adjacent to the documented *B. manganense* site. Because harvesting activities are not proposed within the designated RHCA and with the implementation of project design criteria listed above, there would be no direct or indirect effects to this population as a result of proposed treatments.

Direct and Indirect Effects from Alternative 3

Proposed Salvage Regeneration treatment areas 3, 4, 16, 49, 50, 59, and 61 are adjacent to potential habitat for *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. manganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima*. Because harvesting activities are not proposed within designated RHCAs and with the implementation of project design criteria listed above, there would be no direct or indirect effects to these species habitat and therefore no effect to populations of these species as a result of these treatments.

Direct and Indirect Effects from Alternative 4

Proposed Salvage Regeneration treatment area 65 is adjacent to potential habitat for *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. manganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima*. Because harvesting activities are not proposed within designated RHCAs and with the implementation of project design criteria listed above, there would be no direct or indirect effects to these species habitat and therefore no effect to populations of these species as a result of these treatments.

Direct and Indirect Effects from Alternative 5

Proposed fuel treatment areas 3, 4, 12, 13, 16, 49, 50, 51, 52, 53, 59, 61, 63 and 65 are adjacent to potential habitat for *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. manganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima*. Because thinning and piling activities are not proposed within designated RHCAs and with the implementation of project design criteria listed in chapter 2, there would be no direct or indirect effects to these species habitat and therefore no effect to populations of these species as a result of these treatments.

Proposed fuel treatment area 53 is adjacent to the documented *B. manganense* site. Because thinning and piling activities are not proposed within the designated RHCA and with the implementation of project design criteria listed in chapter 2, there would be no direct or indirect effects to this population as a result of proposed treatments.

Cumulative Effects Common to All Alternatives

Past actions including domestic livestock grazing, timber harvesting, thinning and piling, road side hazard tree removal, reforestation, road maintenance, noxious weed treatments, fire suppression, dispersed camping, hunting, ATV use, mushroom picking, firewood cutting, and permitted water use have contributed to changes in riparian habitats and the plant communities they support. The distribution and vitality of *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. minganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima* before these activities began are unknown.

Historic grazing has resulted in loss of potential habitat for these species through stream downcutting and accelerated erosion processes that significantly alter local surface hydrology. Past timber harvesting has also increased erosion and altered hydrologic relationships. Historic logging practices included skidding logs through riparian areas, which could have destroyed existing plants but could have also provided soil openings for new plants to establish. Fire suppression may have caused a decline in populations through increased competition for soil moisture and nutrients by shade-tolerant plant species.

The 2002 Easy Fire has altered riparian habitats and the plant communities they support (see section on vegetation and fire severity). This fire has altered the habitat conditions for these sensitive species most likely leading to insufficient moisture levels due to decreased shading and/or greater competition by other plant species due to increased light availability. Easy fire suppression activities, especially hand line construction in RHCA's could have destroyed existing plants but could have also provided soil openings for new plants to establish.

Activities proposed in this EIS under all alternatives would not have measurable cumulative effects on these sensitive species because no ground disturbing activities are proposed within potential sensitive plant habitats or known sensitive plant sites, and because of implementation of design criteria.

Future foreseeable activities such as planting of riparian vegetation and resting the area from livestock grazing for a minimum of 2 years would have beneficial effects. Beneficial effects include increase shading in riparian areas that have had shading reduced due to the fire and a short-term (at least 2 years) reprieve in deleterious effects from grazing and trampling.

Effects and Determinations of Effects for Sensitive Species

The three possible types of effects to TEPS (Threatened, Endangered, Proposed, or Sensitive) species that a Biological Evaluation or Biological Assessment can identify, and the corresponding "determinations of effect" to use, are given for TEP species in the 1986 Endangered Species Act regulations (50 CFR Part 402) and the March 1998 FWS/NMFS Endangered Species Consultation Handbook; and for sensitive species in FSM 2670 and in the May 15 and June 11, 1992 Associate Chief/RF 2670 letters on this topic.

Under the No Action Alternative, and Alternatives Two, Three, Four and Five, there would be NO IMPACT (NI) to *Botrychium ascendens*, *B. crenulatum*, *B. lanceolatum*, *B. minganense*, *B. montanum*, *B. pinnatum*, *Carex backii*, *C. interior*, *C. parryana*, *Listera borealis* and *Phacelia minutissima* because no ground disturbing activities are proposed within potential sensitive plant habitats or known sensitive plant sites, and because of implementation of design criteria

References

- Brady, N. C., 1974. *The Nature and Properties of Soils*. Macmillan Publishing Co., Inc. New York:. pp. 341.
- Brooks, P., K. Urban, and G. Yates. 1991. *Sensitive Plants of the Malheur, Ochoco, Umatilla, and Wallowa-Whitman National Forest*, R6-WAW-TP-040-92, USDA Forest Service, Pacific Northwest Region.
- Cronquist, A, A.H. Holmgren, N.H. Holmgren, J.L. Reveal, & P.K. Holmgren, 1977. *Intermountain Flora: Vascular Plants of the Intermountain West, U.S.A.* Columbia University Press, New York.
- Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1969. *Vascular Plants of the Pacific Northwest*, Parts 1-5. University of Washington Press, Seattle, WA.
- Murphey, E.V.A. 1959. *Indian uses of native plants*. Mendocino County Historical Society, Fort Bragg, CA.
- Nelson, J.R. 1985. *Rare plant surveys: techniques for impact assessment*. Natural Areas Journal, Vol. 5., No. 3, pp 18-30.
- Oregon Natural Heritage Program. 2001. *Rare, Threatened and Endangered Plants and Animals of Oregon*. Oregon Natural Heritage Program, Portland, Oregon. 94 pp.
- Salstrom, D. & J. Gamon, 1993. *Draft species conservation strategy for *Listera borealis* Morong on the Colville National Forest*. Washington Natural Heritage Program unpublished report.
- USDA Forest Service. 1999. *Regional Forester's Sensitive Plant List*, Pacific Northwest Region.